

REMARKS

These amendments and remarks are filed in response to the Office Action mailed January 5, 2007. For the following reasons, this application should be allowed and the application passed to issue. No new matter is introduced by this amendment. The amendment to claim 1 is supported by claim 5, as originally filed. Amended claim 6 is supported by claim 1. Originally filed claims 1 and 5 support the amendment to claim 9.

Claims 1-4 and 6-9 are pending in this application. Claims 1-9 have been rejected. Claims 1, 6, and 9 have been amended in this response. Claim 5 has been canceled in this response.

Obviousness Double Patenting

Claim 9 was provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 3-5 of copending Application No. 10/982,056 in view of Yamamoto et al. (U.S. Pat. Pub. No. 2003/0054249). The Examiner averred that the '056 application discloses an energy device comprising a negative active material thin film including at least two silicon thin films wherein a compound of silicon and oxide is present in the interface layer. The Examiner asserted that Yamamoto et al. disclose negative electrode active material that has a 1.6 nm thick oxide surface layer. The Examiner considered it obvious to modify the negative active material of the '056 application to include a 0.2 to 1000 nm thick silicon oxide layer to reduce the hydrofluoric acid level in the electrolyte.

Claim 9 was provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 3 of copending Application No. 10/979,637 in view of Yamamoto et al. The Examiner averred that the '637 application discloses an energy device comprising a negative active material thin film including at least two silicon thin films wherein a compound of silicon and oxide is present in the interface layer. The

Examiner asserted that Yamamoto et al. disclose negative electrode active material that has a 1.6 nm thick oxide surface layer. The Examiner considered it obvious to modify the negative active material of the '637 application to include a 0.2 to 1000 nm thick silicon oxide layer to reduce the hydrofluoric acid level in the electrolyte.

These rejections are traversed, and reconsideration and withdrawal thereof respectfully requested. Amended claim 9 is not obvious in view of the combination of the claims of the '056 and '637 applications and Yamamoto et al., because the claims of the copending applications do not suggest a non-aqueous electrolyte rechargeable battery using a negative electrode active material capable of absorbing/desorbing lithium comprising: an inner layer comprising an alloy containing Si and at least an element selected from the group consisting of Ti, Co, Ni, Cu, Mg, Zr, V, Mo, W, Mn and Fe, and a surface layer comprising silicon oxide of 0.2 to 1,000 nm in average thickness formed on the inner layer, as required by claim 9, and Yamamoto et al. do not cure the deficiencies of the claims of the '056 and '637 applications.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-4 and 7-9 were rejected under 35 U.S.C. § 102(b) as being anticipated by Yamamoto et al. This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the present invention, as claimed, and the cited prior art.

An aspect of the invention, per claim 1, is a negative electrode active material for a non-aqueous electrolyte rechargeable battery capable of absorbing/desorbing lithium comprising an alloy containing Si and at least an element selected from the group consisting of Ti, Co, Ni, Cu, Mg, Zr, V, Mo, W, Mn and Fe. A surface layer comprises silicon oxide of 0.2 to 1,000 nm in average thickness formed on the inner layer.

Another aspect of the invention, per claim 9, is non-aqueous electrolyte rechargeable battery using a negative electrode active material capable of absorbing/desorbing lithium comprising an inner layer comprising an alloy containing Si and at least an element selected from the group consisting of Ti, Co, Ni, Cu, Mg, Zr, V, Mo, W, Mn and Fe. A surface layer comprising silicon oxide of 0.2 to 1,000 nm in average thickness is formed on the inner layer.

The Examiner averred that Yamamoto et al. disclose a non-aqueous electrolyte secondary battery comprising a negative electrode with a thin film silicon layer (3b) and a 1.6 nm thick silicon oxide layer (5b) formed on the silicon layer.

Yamamoto et al. do not anticipate the claimed negative electrode active material and non-aqueous electrolyte rechargeable battery because Yamamoto et al. do not disclose a negative electrode active material capable of absorbing/desorbing lithium comprising an inner layer comprising an alloy containing Si and at least an element selected from the group consisting of Ti, Co, Ni, Cu, Mg, Zr, V, Mo, W, Mn and Fe, as required by claims 1 and 9. The Examiner apparently recognized that Yamamoto et al. do not anticipate amended claims 1 and 9, as the Examiner did not reject claim 5 as being anticipated by Yamamoto et al.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Because Yamamoto et al. do not disclose a negative electrode active

material capable of absorbing/desorbing lithium comprising an inner layer comprising an alloy containing Si and at least an element selected from the group consisting of Ti, Co, Ni, Cu, Mg, Zr, V, Mo, W, Mn and Fe, as required by claims 1 and 9, Yamamoto et al. do not anticipate claims 1 and 9.

Applicants further submit that Yamamoto et al. do not suggest the claimed negative electrode active material and non-aqueous electrolyte rechargeable battery.

Claim Rejections Under 35 U.S.C. § 103

Claims 5 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto et al. in view of Kawase et al. (U.S. Pat. Pub. No. 2004/0142242). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The Examiner acknowledged that Yamamoto et al. do not teach the negative electrode comprising an alloy of Si. The Examiner asserted that Kawase et al. disclose an anode comprising Si that is alloyed with the current collector and the current collector can comprise Ti, Mg, Zr, Mo, W, Mn, Co, Ni, and Fe. The Examiner considered it obvious to include the Si alloy in the negative electrode of Yamamoto et al. to inhibit breakage due to expansion or shrinkage of the anode active material layer during charge and discharge and to improve electronic conductivity.

This rejection should be withdrawn, as Kawase et al. is not prior art to the claimed invention. A certified English translation of the instant Japanese Priority document No. 2003-0099523 is attached to this response. The filing date of JP 2003-0099523 is April 2, 2003 which precedes the November 18, 2003 U.S. filing date of Kawase et al.

The dependent claims are allowable for at least the same reasons as claim 1, and further distinguish the claimed negative electrode active material.

In view of the above remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Response or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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